

# Letter 10

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**WILLIAMS RESEARCH**  
**John Paul Williams, Principal Investigator**  
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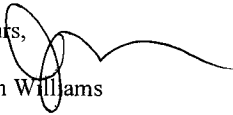
Dear Sir/Ms:

Here are comments regarding the DEIS for the Wanapa Energy Center near  
Hermiston, Oregon, on behalf of:

Ivan Neads  
32855 W Walls St.  
Hermiston, OR 97838.

Please sent the FEIS to my address above. Please also notify me of any other  
public comment opportunities regarding this project.

Yours,

  
John Williams

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## **EXECUTIVE SUMMARY**

This DEIS failed to comply with NEPA because of errors which include, but are not limited to the following: The DEIS failed to provide an accurate purpose and need statement, it failed to study alternatives to reduce its water use, and the DEIS also failed to take the requisite "hard look" at its water use and discharge impacts, its ammonia use, and the cumulative air quality impacts.

## **PURPOSE AND NEED**

It's very important how the DEIS defines the "purpose and need" of this project. The stated project purpose and need is to supply energy for base and peak electricity demands. But there is no specific evidence presented regarding any local or regional demand for base or peak supplies of 1300 megawatts of electricity. The only evidence presented is general data describing a 1-2% annual growth in national energy needs.

The WEEC study cited in the DEIS to support assertions of an energy need is already 3 years old. The DEIS failed to describe whether it is even accurate regarding its first three years of predictions. That study also said there is adequate generation to meet needs for 10 years.

The WECC's more current data shows that the Northwest's generating capacity is already predicted to increase by 3100 MW by 2003 to over 81,000 MW, compared to the needed reserves of only 65,600 MW, and that energy demand actually fell from 8-11% from 2000 to 2001. (WECC, 2002 Information Summary).

As for the NPPC, it now predicts that the needed 3100 MW will be added by December, 2002, in its Power Supply Outlook, May, 2001-April, 2002.

Over 2600 megawatts were recently added to the Northwest grid: Hermiston Power Partners, Chehalis, Rathdrum Generation, Klamath Falls Cogen, the Hanaford turbine, and Frederickson II, along with upgrades at Puget Sound Energy/Fredonia, and smaller turbines added at Willamette Industries and elsewhere.

There are also at least another 2000 megawatts under construction; Goldendale Energy, Miriant Mint Farm, Satsop I, and Coyote Springs II, along with another 6000 Mw that are virtually or actually fully permitted and/or are declining to start construction; Plymouth Energy, Garnet Energy, PGE/Tacoma, Tahoma Energy, Umatilla Generating, Wallula, Sumas II, The Cliffs, Summit/Westward Energy, Port Westward, and Everett I & II.

In other words, even if there was a 3000 Mw shortfall predicted three years ago, that gap has been more than filled by this addition of over 4600 Mw of constructed or permitted gas-fired power plants, in addition to another 1000-odd Mw of constructed wind power. In fact there is now a glut of natural gas fired energy. There is no evidence that the market can support another facility. The Mint Farm and Satsop I plants have had their construction recently terminated when the plants are more than half built, and Goldendale Energy has delayed completion of their plant for a year.

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**10-1** The current wholesale power market in the western U.S. and Canada encourages the development of efficient power generation facilities to satisfy increasing power demands and to discourage the development of inefficient and unnecessary facilities. In this market, project developers are expected to move forward with construction of projects only when convinced that a demand exists for the power that the facilities would produce. Project financing, likewise, depends on a demonstration of demand and economic benefit.

The recent "Northwest Regional Forecast of Loads and Resources for August 2004 through July 2009," compiled by PNUCC<sup>1</sup>, and the similar report for the year 2003 and other forecasters, show a peak power deficit every year during the next five-year reporting period, and an energy deficit starting in 2008-2009, based on an average hydropower conditions.

Still, many economic factors would influence future demand for electrical power, and the current response of power developers to shut down or abandon power projects is mostly related to their current difficulties in meeting their financial obligations, balance sheet weaknesses and credit ratings. The Wanapa project is not a merchant plant as most of the projects noted in the comment and it intends to be a long-term provider of electrical power based on long-term contracts. The proposed project plans to be competitive in the marketplace, or it won't be built.

Finally, one of the primary aspects of the purpose and need of the project includes economic benefits to the CTUIR that represent objectives that the BIA must address as part of its trust responsibilities.

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<sup>1</sup> Pacific Northwest Utility Conference Committee ([www.pnucc.org](http://www.pnucc.org)).

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## Responses to Letter 10

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Another dozen plants have recently withdrawn or delayed their proposals, such as Mercer Ranch, North Idaho Power, Kootenai Power, and Morrow Generating. Others (another 3000 Mw) also have applications pending; Turner, Coburg Energy, COB and BP.

In other words, the Purpose and Need Statement for the DEIS is outdated and inaccurate. The Agencies' decision to proceed with permitting of this plant runs the risk of committing and squandering public agency staff and the public's time, and natural resources, land uses, and investment capital, for a power plant that is not needed in the foreseeable future.

### NEPA COMPLIANCE

The twin goals of NEPA, 42 U.S.C. 4331 et seq., are to guarantee that:

1) federal agencies take a "hard look" at the consequences of their actions before the actions, and that an EIS contain a discussion of the "alternatives to the proposed action." This discussion of alternatives is at "the heart" of the NEPA process.

(1) federal agencies take a "hard look" at the consequences of their actions before the actions occur by ensuring "that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts," *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989); and (2) "the relevant information will be made available to the larger audience that may also play a role in both the decision making process and the implementation of that decision." *Id.* at 349. NEPA requires federal agencies to look before they leap.

A "hard look" requires the agency to engage in a "reasoned evaluation of the relevant factors" to ensure that its ultimate decision is truly informed. *Greenpeace Action v. Franklin*, 14 F.3d 1324, 1332 (9th Cir. 1992). The EIS analysis must be searching, detailed and comprehensive; "[g]eneral statements about 'possible' effects and 'some risk,' do not constitute a 'hard look' absent a justification for why more definitive information could not be provided." *Neighbors of Cuddy Mountain v. United States Forest Service*, 137 F.3d 1372, 1380 (9th Cir. 1998).

NEPA is designed to ensure a fully informed and well-reasoned decision. "In so doing, the EIS insures the integrity of the process of decision by giving assurance that stubborn problems or serious criticisms have not been 'swept under the rug.'" *Silva v. Lynn*, 482 F.2d 1282, 1285 (1st Cir. 1978).

This DEIS does not comply with these and other NEPA requirements, by failing to study alternatives for water cooling and power line designs, and by failing to take a hard look and

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provide information on air cooling, cumulative air impacts, global warming, risks of fire and explosion, and other topics as discussed in greater detail in the rest of these comments.

### **THE DEIS FAILED TO DISCUSS REASONABLE PROJECT ALTERNATIVES**

NEPA requires that an EIS contain a discussion of the "alternatives to the proposed action." This discussion of alternatives is at "the heart" of the NEPA process. 40 C.F.R. 1502.14. The CEQ regulations require the agency to "[r]igorously explore and objectively evaluate all reasonable alternatives." 40 C.F.R. 1502.14(a). To do so, the agency must take a "hard look" at the environmental consequences of each of the alternatives. The failure to examine ANY viable project alternative will render the EIS inadequate.

Consideration of project alternatives is the heart of NEPA and this obligation is ignored at great legal peril. But this DEIS did not examine a single alternative other than "no project" and some minor tinkering with transmission line or pipeline routes.

### **ALTERNATIVE COOLING DESIGNS**

The project's primary impact is its massive water use. But the DEIS lacked a comprehensive discussion of alternative designs for this project to mitigate this impact, including, but not limited, to air, hybrid, and grey water cooling methods. Indeed, the DEIS baldly claimed at 2.39 that "No ... option was identified that would reduce (water supply) environmental impacts."

Using air cooling, or a hybrid cooling system, are plainly viable alternatives that would all avoid or reduce the project's proposed surface water impacts. Indeed, this very developer (Diamond) proposed air cooling for its power plant in southern Nevada. Diamond's Ivanpah DEIS stated plainly that its air-cooled 500 Mw power plant "...reduces water use by 90% or more as compared to wet cooling with a conventional cooling tower ... dry cooling (for a 500 Mw plant) reduces water usage from 3000 acre-feet to more to 300 acre-feet." (P. 3-1) Diamond's Ivanpah DEIS did not contain a single word about any disadvantages of air cooling. But now, in this DEIS, there is no mention of air cooling at all. Clearly, this DEIS failed to take a "hard look." as required by NEPA, at the plant's massive proposed water use and the alternative of air cooling.

### **ALTERNATIVE DESIGNS TO FURTHER REDUCE WATER USE AND DISCHARGE**

The proposed plant will use water cooling. It will consume a peak of over fifteen million gallons per day of water. This is a massive rate of water use for this size of power plant. Many power plants are designed to use far less water by any measurement.

For instance, the operating natural gas fired Chehalis power plant will use only about 1.3% as much water to generate about 50% as much power. The Chehalis plant will be a 550 MW air cooled plant, while Wanapa will be a 1200 MW water cooled plant. Chehalis will use 192,000 gallons of water per day, while Wanapa will use over 15,000,000 gallons per day, or almost 100 times as much water at peak use.

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10-2 See response to Comment 5-6.

Alternative power generating projects, such as coal, oil-fired and nuclear plants in lieu of a gas fired gas turbine plant, were eliminated due to high cost and environmental impacts and regulatory barriers.

10-3 **Alternative Cooling Designs.** A dry cooling system at the Wanapa plant would add approximately \$83,200,000 to the construction cost of the total facility or \$41.62 millions to the cost of one block of 600 MW (nominal). Because this system of cooling is less efficient there would be a 4 to 5 percent power loss on the steam turbine generator, which must partly be made up by the combustion turbines and duct burners resulting in higher fuel use and emissions. This would put the Wanapa project at a competitive disadvantage to the other water-cooled plants in the Pacific Northwest.

Diamond's Ivanpah project is located in an arid region where there is no surface water available in the area. Diamond Ivanpah project serves a very fast growing market and remain competitive despite the cost of development. The air-cooled Doswell plant, located in Virginia, also was developed by Diamond.

The commenter references the Plymouth project for its hybrid design. The following information is available in the Plymouth EIS in the public domain.<sup>1</sup> In order to maintain efficiency, Plymouth would operate the air-cooled condenser during the cold weather periods (when water is abundant) and would operate the water-cooled condenser during the summer (when water is less available). While such an operation would conserve water, this conservation is not beneficial due to the season of use versus water availability. Installation and operation of two 100 percent condensers similar to the Plymouth project would add substantially more than the \$83,200,000 to the cost of the project and it would make the project economically uncompetitive.

The project evaluated use of gray water. However, due to the lack of sufficient quantities available from either Hermiston or Umatilla this option was eliminated.

<sup>1</sup>Plymouth Generation Facility Final EIS located at: [www.bpa.gov](http://www.bpa.gov)

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### 3-3 Cont'd

**Water Flow Quantity.** This response to the water flow comments must address the quantities noted in the comments. The statement, “it [the plant] would use a peak of over 15,000,000 gallons per day of water” is misleading. In this context, peak flow is defined as that flow which would occur at certain hours of the summer day where the ambient temperature is at the highest (109°F). It is worth noting that this project would use substantially less water when ambient temperatures are low (morning, night, spring, fall, and winter). For the Wanapa project, the plant average water flow is less than one-half of the 15 million gallons per day. It varies from 8 MGD on a cold winter day to 11.5 MGD during the hottest summer day with an average yearly flow of 7.99 MGD. The figure of 5.4 billion gallons per year cited by the commenter can only be arrived at if the peak flow would take place 365 days per year, which is the equivalent of hot ambient temperatures (109°F) occurring every hour and every day of the year (365 days).

Approximately 80 percent of the water is evaporated to get rid of the heat from the steam condenser. Therefore, comparison between of water-cooled plants and air-cooled plants would not produce an accurate water use per MW of generation. The referenced Chehalis plant is a 550-MW (nominal) air-cooled plant. A comparison of the water use between the 550-MW air-cooled Chehalis plant and the 1,200-MW (nominal) water-cooled Wanapa plant would technically be inaccurate and produce non-comparable results. Diamond’s Ivanpah project, which also is a 550-MW (nominal) air-cooled plant, if compared to Chehalis, also would offer an accurate comparison. Diamond’s Ivanpah project uses much less water than the Chehalis plant.

**Greenhouse Gas Emissions.** Steam/water vapor in the form of clouds in the atmosphere is a commonly occurring phenomenon. The proposed turbines would emit the primary and greenhouse gas (GHG) pollutants of CO<sub>2</sub>, methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). The water vapor from the cooling towers is not considered a major greenhouse gas. A GHG emissions inventory has been prepared for these pollutants from Wanapa. The emissions of each pollutant are multiplied by the respective Global Warming Potential (GWP) for a 100-year time horizon to convert the results into a single CO<sub>2</sub> equivalent emissions value. The results are shown in Table below.

**Table**  
**Greenhouse Gas Emissions from Wanapa Energy Center**

Pollutant	Annual Emissions (1,000 tons)	Global Warming Potential (GWP) 100-year	Annual Emissions, CO <sub>2</sub> Equivalent (1,000 tons)
CO <sub>2</sub>	4594.6	1	4594.6
Methane	0.28	21	5.8
N <sub>2</sub> O	0.0055	310	1.7
<b>Total</b>			4602.2

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For the mitigation of the GHG gases and other environmental impacts, the Wanapa project has established an environmental mitigation foundation where \$8,000,000 or \$16,000,000 would be deposited into the fund for an 600 MW (nominal) or 1,200 MW (nominal) plant respectively, at the close of project finance. The proceeds from the funds would be used for environmental mitigations in perpetuity in the region. This fund exceeds the State of Oregon requirements over the life of the plant. Wallula was required to deposit \$5.35 million for the 1,300-MW (nominal plant) for greenhouse gas mitigation, which is less than a third of the 1,200-MW Wanapa Environmental Foundation funds.

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### **AIR COOLING**

The DEIS should have discussed alternative designs to mitigate the plant's water use, which would include air cooling, rather than water cooling for the facility.

Heated water vapor is also widely recognized as a contributor to the global warming problem.<sup>1</sup> A change to air cooling would also eliminate this discharge of water vapor, thus partly mitigating the facility's greenhouse gas emissions.

10-3

### **HYBRID COOLING SYSTEMS**

These types of plant designs use a combination of both air and water cooling. The Wanapa plant DEIS should have discussed hybrid water/air cooling as mitigation of the proposed use of high quality groundwater for plant cooling purposes. The Plymouth Energy plant, recently permitted in eastern Washington, will use a version of hybrid cooling. It will use about one-fourth as much water per megawatt as will Wanapa. Plymouth Power will use 1 million gallons of water as a daily average, to generate 307 Mw. In other words, Plymouth will use 1/15th as much water to generate 1/4 as much power.

### **WATER QUANTITY IMPACTS**

Instead of discussing reasonable water conservation alternatives that are in wide use, the DEIS attempts to trivialize the power plant's unnecessary consumption of almost 15 million gallons of water per day, which is far more than similar power plants already constructed or proposed for the Pacific Northwest and elsewhere.

For instance, the DEIS at 2-39 describes the Columbia River as an abundant and reliable water supply. This statement ignores the reality that the project is located in a desert with annual rainfall of less than 10 inches. The DEIS fails to acknowledge that water in this area is a scarce resource, with an extremely high priority for many competing uses. A high level of water conservation should be required, yet the DEIS claims no alternatives are available, even though the DEIS admits at 2-45 that groundwater resources in the vicinity are extremely limited.

10-4

The DEIS inaccurately assumes that this 15 million gallons is "available" even during low flow periods on the Columbia River. In fact, current water rights on the Columbia River, if fully exercised, may actually oversubscribe the River's flows. While this plant will not require a new water right, it will, by itself, consume a large increment of the Port's water rights, thus rendering 5.4 billion gallons of water per year unavailable for other uses. This means that the Port will no longer have a large unused water right available for future uses; that is a significant adverse impact and alternatives that reduce its impact must be discussed in an DEIS.

During recent, past droughts, as recently as 2001, many large industrial users such as the Atochem plant, and several large agricultural water users in eastern Washington have been forced to shut

10-4 See responses to Comments 5-5 and 6-3.

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<sup>1</sup> California Energy Commission, 1991.

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10-4 down, threatened with shut-down, and/or forced to vastly reduce their water use because of lack of water. Plainly, one of the biggest adverse impacts from the Wanapa Project is on water availability. Its consumption of about 5.4 billion gallons per year of Columbia River water could draw down reduce riparian and aquatic habitat, degrade habitat for threatened and endangered aquatic species, including salmon, and endanger senior water rights. No mitigation is proposed.

### **PROPOSED WATER USE IS NEEDLESSLY WASTEFUL**

The DEIS should have discussed the wasteful implications of Wanapa Power being a single use facility with no usable discharge, unlike cogeneration power plants, which discharge steam for reuse by industrial facilities. Nor does Wanapa reuse gray water like other power plants, including the new facility in Klamath Falls, or reuse agricultural processing water like other plants in the Hermiston/Umatilla area. Its use of cooling towers will needlessly create salt drift and particulate fallout from the massive discharges from its cooling towers and smokestacks in the project vicinity, which will degrade soils, and surface and ground waters from its fallout.

10-5 For instance, the Wanapa Project could reduce water usage by 90% with air-cooling technology. Instead it proposes to squander precious surface water, in a desert, with an inappropriate technology of water-cooling only. The proposed 5 billion gallons of annual usage is a plainly wasteful, single end use with very limited economic benefit, and with troubling environmental consequences. As the California Water Resources Resolution #75-58 and the current California Attorney General have stated:

“The loss of inland waters through evaporation in power plant cooling facilities may be considered an unreasonable use of inland waters...When clean, high-quality water is consumed by a disfavored source, such as cooling towers, **this is nothing but reckless waste.**”

The California Attorney General noted that proposed and/or operating California power plants, including the Sutter, Delta Energy, and Los Medanos, Otay Mesa, Metcalf, Moss Landing, and Nueva Azalea power plants, all are either air cooled, or use recycled waste water. While California policy has no legal implications for the Wanapa plant, it does state that use of high quality water for power plant cooling is a reckless waste, with the authority of a Water Resources Agency in a large neighboring state. This powerful opinion that the Wanapa plant is committing a reckless waste of surface waters, should prompt the preparation of a supplemental DEIS that discusses the alternative of air cooling as a project design.

### **SUPPLEMENTAL DEIS TO STUDY AIR COOLING**

10-6 Indeed, when the BPA was conducting its NEPA review of the Chehalis facility, after public comments called for air cooling at that facility, BPA did prepare a supplemental DEIS to discuss air cooling of that plant. That was a fortunate decision. Years later, when air cooling was chosen for that plant, no additional NEPA review was then necessary.

Furthermore, the President of the United States convened a group of experts who produced a

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10-5 See response to Comment 10-3.

10-6 See response to Comment 10-3.

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National Energy Policy document. This Policy presented a comprehensive approach to a range of Energy issues, including construction and operation of new power plants. This Policy stated:

“Federal and state regulators are working with businesses and communities to mitigate ... adverse impacts (from energy generation) by ... fostering the use of technologies that both protect environmental goals and meet energy production goals.

For example, as a result of an analysis under the National Environmental Policy Act of the impacts of a new power plant in California, the company building the plant agreed to change the design to use a dry cooling method. This change reduced ground-water consumption by 95% and eliminated both cooling tower “blowdown” water and particulate emissions, while still achieving the desired energy production.” (National Energy Policy p. 3-7)

In other words, Energy Policy proposals from the highest office in the land recently made a specific point that a NEPA analysis has already found that air cooling of power plants is an acceptable and desirable compromise between environmental impact and energy production. We urge the BIA/BPA to follow those recommendations, and study air cooling of the Wanapa proposal as an environmentally preferable alternative.

Wanapa will be a year-round user with higher usage rate during the warmer months when appropriated water demand is highest. The plant could be redesigned to a “hybrid” air and water-cooling system, in which full water cooling would be used only during the hottest weeks, and air cooling would be used at all other times. This hybrid cooling technology is proposed for use at the Sumas II plant in Northwest Washington and is in use elsewhere.

The best project alternative is avoiding the impact of the massive water withdrawals. The best method of mitigation for the Wanapa project is to reduce their water usage by 90% with air-cooling. That would minimize the depletion of stream flow and would preserve the Port’s water rights for future demands.

Many existing and proposed power plants are solely air cooled, including the two operating Neil Simpson plants and the Wyodak plant in Wyoming, the operating Rosebud power plant in Montana, the operating Crockett plant in California, the operating Chehalis Power facility in the State of Washington, the operating Doswell facility in Virginia, the operating Matimba, Kendal, and Eskom powerhouses in South Africa, the operating Linden and Sayreville plants in New Jersey, Taiyuan #2 in China, Trakya in Turkey, Uran III in India, Tousa in Iran, and the Camarillo facility in Ventura County, California.

The California Attorney General noted that the proposed/operating power plants in California, including the Sutter, Delta Energy, and Los Medanos, Otay Mesa, Metcalf, Moss Landing, and Nueva Azalea power plants, all are either air cooled, or use recycled waste water.

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Other proposed air-cooled plants are the Colorado Springs Utility plant near Fountain, Garnet near Boise, Idaho, PPL/Starbuck, Reliant Energy's Choctaw County and Hunterstown, Pennsylvania plants, the Mercer Ranch proposal near Tri-Cities, Washington, and the proposed Duke and Mirant plants within the jurisdiction of the Las Vegas Water District.

10-6 In fact, published accounts state that the project developer for the Wanapa plant, Diamond Generating, proposed air cooling for its 500 Mw Ivanpah Energy Center, near Goodsprings, Nevada. Published accounts quote Diamond Generating as said their Ivanpah 500 Mw plant would use only 30-50 acre-feet of grey water annually. This is an amazingly small amount compared with the shocking 12,286 af proposed for Wanapa.<sup>2</sup> Even though Wanapa is 2.5 times larger than Diamond Energy's Ivanpah proposal, it is using 245 times as much water.

### **HYBRID COOLING SYSTEM**

10-7 This is a plant design that uses a combination of both air and water-cooling, and are in use at the West Cogeneration plant in Germany, and the Exeter Energy plant in Conn., USA, and is proposed for the Sumas II facility, and the Plymouth Power in eastern Washington. Water use is cut approximately in half. The NEPA analysis have should considered and discussed the hybrid cooling system as a viable alternative in the DEIS.

### **GREY WATER**

10-8 The recently permitted Klamath Falls power plant is the only latest of many plants in the United States that uses gray water (reused water), rather than high quality surface water for power plant cooling. Diamond's Ivanpah plant also proposed use of grey water.

### **MITIGATION BY AVOIDANCE OF THE WATER USE IMPACT-CONCLUSION**

In summary, almost 40 plants that are proposed or are operating with either air cooling, recycled waste water, or hybrid cooling systems. We are sure there are more. This list demonstrates that there are readily available alternative methods of cooling which avoid the wasteful water use proposed by Wanapa, that are available and in common use.

10-9 Wanapa's wasteful use of an inappropriate cooling technology threatens other beneficial uses, both now and in the future, specifically the appropriations of senior water rights, particularly in drought years. Again, the NEPA analysis should study whether the project could choose to use air-cooling or hybrid cooling methods, which would reduce this waste and reduce the damage to the water resources of the state.

The Wanapa plant does not integrate or coordinate with other water usages. The plant will consume over 5 billion gallons of pure water yearly for a single use, and would provide a mere handful of jobs.

Wanapa is not a cogeneration plant, like the new Klamath Falls facility, where the plant's steam is

<sup>2</sup>17 cfs times 1.98 times 365 days.

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10-7 See response to Comment 10-3.

10-8 See response to Comment 10-3.

10-9 See response to Comment 10-3.

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shared with another industrial facility. Instead, the proposed plant is on an isolated, inappropriately zoned area, which will serve no other businesses. It does not reuse gray water for cooling like the Klamath Falls facility. The resulting waste water is unfit for irrigation because of its high TDS levels and will serve only a single purpose.

Furthermore, the current power plant market is extremely speculative, and is in a boom/bust cycle of over-building of power plants in hopes of raising rates and increasing profits. Calpine, one of the nation's largest power plant builders, recently announced the suspension of over 30 proposed power plants. Cogentrix itself has announced the delay of proposed plants in Washington and West Virginia. This competitive exploitation is to be discouraged when it involves public waters.

The project will not serve balanced multiple uses. Instead, it will concentrate the one of the largest water appropriations in the Basin into the hands of a single user, who will not reuse gray water, will not provide steam, and will produce only a small water return flow containing concentrated levels of metals and high TDS concentrations.

10-9 We suggest that the FEIS should adopt mitigation requirements that closely follow the State of California rules regarding water sources for power plant cooling waters. In sum, actually and potentially potable water should not be squandered as a power plant cooling source, unless and until all other alternatives have been discussed, examined, and exhausted.

Completely or partially air cooled plants, with vastly reduced water demands, currently run reliably, and profitably. This very same developer Diamond Energy, proposed an air cooling for its Ivanpah plant in southern Nevada, as discussed. The California Energy Commission has conducted many reviews, and issued approvals of air cooled plants. The proceedings of these reviews contain copious evidence that air cooling of power plants is fully economically feasible. In one case, for instance, an expert witness testified that air cooling of a power plant would cost only .03% percent of the internal rate of return of the facility.<sup>3</sup>

Simply put, the most important water mitigation measure that should be required, is water conservation through partial or complete air cooling, as is proposed, or done, at scores of similar power plants across the country and world. But the DEIS was utterly silent on this vital topic. This violates the important twin principals of NEPA; there was no hard look taken at the plant's water use, and there was no alternative design discussed.

### WASTEWATER DISCHARGES

10-10 The plant will run its cooling water through 6 cycles before its discharge to a reservoir. This will concentrate metals and other trace contaminants in the Columbia River by 600%. Table 3.2-3 in the DEIS shows the resulting concentration of metals and other contaminants in the effluent. Metals in the effluent will be six times the concentration present in the influent. The DEIS at

<sup>3</sup>Testimony of Dr. Fox. Elk Hills Case Proceedings. Page 111.

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10-10 The raw water from the Columbia River would be treated by coagulation and filtration prior to use in the plant. Some constituents in the water, such as mercury, are partially removed by these processes or evaporated in the cooling tower. As a result, the concentration of some constituents in the effluent would be significantly less than six times the incoming raw water concentration.

The relative impact of metals' concentrations in the effluent is evaluated after it is mixed with water in the Cold Springs Reservoir. The ODEQ's mixing zone calculation would be applied in determining the metals' concentrations at the edge of the mixing zone and its potential toxicity to aquatic organisms. If it is determined that the concentration of a metal at the edge of the mixing zone is above state water quality standards, the plant would treat the water to reduce the concentration of that metal in the effluent before discharge.

The plant discharge water is treated for temperature in the cooling tower. The project intends to use an efficient cooling tower where the water temperature would be much lower than the ambient air dry-bulb temperature. For example, when the air dry-bulb temperature is 93°F, the cold water temperature from the cooling tower may be lower than 75°F. When the air temperature is below 20°F (site minimum average temperature), the water discharge from the cooling tower would be approximately 40°F (to prevent icing) and the plant discharge temperature (due to the cooling effects of the holding pond) would be approximately the same temperature as the surface water of Cold Springs Reservoir.

The toxicity of some metals increases as temperature increases. The average temperature of the effluent, would be approximately 70°F to 75°F in the summer where the effect on metals toxicity would be negligible.

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3.2.14 claims that metals levels in the effluent will not approach water quality criteria.

The mercury concentration in the influent is shown as 2.3 ug/l. This would produce 13.8 ug/l in the effluent, but the table claims that resulting mercury concentrations will only be 1.6 ug/l. The DEIS should have explained how the power plant will take water containing mercury at 2.3 ug/l, concentrate it 6 times, and end up with lower concentrations of mercury than before. It is more likely that mercury in the effluent will be at levels of 13.8 ug/l, which vastly exceeds the chronic fresh water criteria of .012.

Table 3.2-3 predicted levels of copper at 6 ug/l in the effluent. But Table 3.2-1 shows that Spring, 2003 analytes revealed total recoverable copper at 1.6 ug/l, meaning that the effluent will contain peak concentrations of total copper at levels of about 9.6 ug/l. Copper at this concentration is known to cause adverse impacts in fish, especially with the bioaccumulative nature of copper. The EPA Gold Book states, for instance, that the chronic threshold for brook trout exposure to copper is only 3.873 ug/l. Several studies also indicated that elevated water temperatures also increased the toxic effects of copper on trout.

Since the effluent will be discharged at temperatures as high as 96 degrees Fahrenheit, there will be a cumulative adverse impact on affected aquatic species from the combination of both copper and heat. In addition, sub lethal discharges of zinc, in combination with heat and copper, have also been linked to increased adverse impacts on trout and related species. Wanapa will be also be discharging zinc. An EPA study noted that when sub lethal zinc concentrations are simultaneously present, concentrations of copper as low as 10 ug/l can suppress gill functioning.<sup>1</sup>

Table 3.2.3 shows TDS will be at 1600 mg/l in the waste water, which exceeds groundwater quality criteria in Oregon. Reuse of that concentration of TDS for irrigation water could cause significant adverse impacts on groundwater, even after dilution by reservoir water.

The DEIS at 3.2. 12 falsely claims that maximum reuse of water takes place at Wanapa. The proposed 6 cycles is only half as many cycles of cooling water as are proposed at many power plants. Maximum re-use would involve far more than six cycles.

### **IMPACTS FROM WATER DISCHARGES**

The DEIS should have provided information on the toxicity of inhibitors or algicides that would be discharged in the waste water, including but not limited to chlorine compounds, such as sodium hydrochlorite, which were listed at 2-9.

The DEIS claims that chlorine levels are non-toxic but proposed amounts of chlorine compounds to be used, and the resulting concentrations, are not presented at 3.2-13, either. The DEIS reference to a potential chlorine compound feed rate of 1-20 ppm would be a highly toxic level and could exceed the chronic and acute water quality standards for chlorine.

3.2-18 admits that the hydrostatic water is contaminated but fails to present likely concentrations

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**10-11** The water quality data collected from the Cold Springs Reservoir indicates that the TDS loading from the effluent would not significantly increase the TDS concentration in the reservoir such that irrigation uses would be affected. The average monthly flow to Cold Springs Reservoir would be less than 0.4 percent of the reservoir capacity.

**10-12** The PSD permit issued by the USEPA would require a limitation on TDS in the cooling water - higher cycles of concentration would result in higher TDS and PM<sub>10</sub> which would cause violation of air permit limits. While it is economical for Wanapa to operate at higher cycles of concentration, the PSD permit's TDS (and PM<sub>10</sub>) limitation requires operation at lower cycles of concentration. In addition, higher cycles of concentration may affect the NPDES permit. Cycles of concentration are determined by the quality of the raw water. The upper limit of cycles of concentration is determined based on the concentrations of constituents in the raw water together with consideration of equipment efficiency, and environmental impacts on the air and discharge water. The raw water analytical data was used to calculate the maximum concentrations that could be tolerated without jeopardizing plant efficiency. There are a number of constituents such as calcium, magnesium, silica, sulfate and carbonate that become insoluble above a specific concentration and begin to deposit out on operating surfaces in the plant. These deposits eventually interfere with heat transfer, affect plant efficiency and significantly increase operating and maintenance costs.

**10-13** The corrosion inhibitors that would be used are primarily phosphate-based and organic polymer based compounds with very low or negligible toxicity. The primary biocide used in the cooling system would be sodium hypochlorite, which would generate chlorine compounds in the cooling water. However, chlorine compounds are rapidly reacted in this type of system and the sodium hypochlorite feed rate would be controlled to provide a small excess over system consumption. In addition, the NPDES permit for discharge of the effluent would have very strict limits for discharge of chlorine from the facility.

If the discharge water is not within the limits of the NPDES permit for chlorine, the facility would be equipped with a de-chlorinator to treat the water to bring it to within permit requirements.

Normally the hydrostatic test water is reused for subsequent tests and finally collected and trucked off site by a qualified contractor to a licensed facility. Hydrostatic test water may have low concentrations of oil and suspended solids. If it were necessary to discharge hydrostatic test water to Cold Springs Reservoir, such discharge would be conducted under the NPDES discharge permit and would meet permit limits and state water quality standards. If the test water were determined not to conform to regulations and permit limits, it would be collected and trucked off site by a qualified contractor to a licensed facility.

## Letter 10 Continued

- 10-13 of pollutants. Hydrostatic water will be contaminated with oil and grease and other pollutants and will be unacceptable for discharges to surface waters, as proposed in the DEIS.
- The DEIS contains no detailed discussion of whether this location is an appropriate siting for a septic system for or more 30 people, although that is proposed.

### **CUMULATIVE AIR QUALITY IMPACTS**

- 10-14 While EPA will issue the air permit to this proposed power plant, there are many air quality impacts that are not regulated by EPA and were not adequately discussed in the DEIS. We believe that these air quality impacts should have been discussed in the DEIS and the BIA and BPA should seek appropriate mitigation for these impacts. This includes the cumulative air impacts, ammonia emissions, including secondary emissions, and some of the types of emissions affecting sensitive lands and Class I areas.

The DEIS should have provided a detailed discussion of the cumulative air quality impacts from the proposed project, in combination with the many proposed, and recently constructed power plants, and other air pollution sources, within a 200 radius of the project, and along with other regional NOx sources. The Plymouth Power EIS, for instance, furnished a much more comprehensive presentation of air emissions and impacts data from that facility, which was only 1/4th the size of Wanapa.

### **DEIS FAILED TO MODEL WANAPA'S IMPACTS, IN SHARP CONTRAST TO MANY OTHER RECENT POWER PLANT NEPA REVIEWS**

- 10-15 Rather than present an actual analysis of Wanapa's impacts, the DEIS simply offers an inaccurate 1-page summary of Wanapa's purported air quality cumulative impacts, referring to a past BPA air quality study. But all other recent DEISes on Northwest power plants, including Plymouth, and Wallula have stated in so many words that BPA was going to examine potential cumulative regional haze impacts from power plants, on a case-by-case basis. That pledge has been violated by the failure of this DEIS, for which BPA is a cooperating agency, to provide a specific modeling analysis of the Wanapa project.
- The DEIS did not acknowledge this significant cumulative impact from the new generation of power plants in eastern Oregon and Washington, and did not cite previous certifications from the Federal Land Managers that air quality in this vicinity was already significantly degraded.
- For instance the Forest Service's 2/7/02 letter certified that visibility impairment in Northwest Class I areas has already been degraded more than 10%. Because of this certification, new large sources of air pollution must not add more than .4% degradation of the visibility at times when total impacts on visibility exceed 10%, based on FLAG2 criteria. Wanapa will cause a larger degradation to visibility than this .4% threshold. The DEIS should have discuss this potential breach of air quality guidelines. Instead, the DEIS made only a passing reference at 3.4-20 to Wanapa's alleged compliance with a different FLAG2 threshold, that an individual plant not cause more than a 5% extinction by itself. The DEIS presented no supporting data for this abrupt

## Responses to Letter 10

The preferred method of sanitary waste disposal would be through a connection to the City of Umatilla's sanitary wastewater system. However, if this option cannot be implemented, the plant site has been thoroughly evaluated for all geotechnical characteristics including the siting of an on-site septic system. If a septic system would be installed, then the waste from the septic system would be trucked offsite by a licensed contractor for disposal to an approved site.

- 10-14 See response to Comment 2-1 for cumulative effects analysis for Class I areas and response to Comment 5-3 for cumulative effects analysis for Class II areas.
- 10-15 See response to Comment 2-1 for cumulative effects analysis for Class I areas and response to Comment 5-3 for cumulative effects analysis for Class II areas.

## Letter 10 Continued

conclusion, unlike the several other EISes performed on Northwest power plants, which presented, in several cases, entire appendixes to the NEPA document which described the project's individual and cumulative air quality impacts. The DEIS' claimed that Wanapa's individual maximum contribution to haze at any Class I area was a 2.37% increase. This is doubtful, because Plymouth would cause a 2.20% increase in haze at Mt. Hood, and Wanapa is even closer to Mt Hood, and will emit 5 times as much pollution as Plymouth. Therefore it is likely that Wanapa will have more than a 2.37% impact on Mt. Hood

The DEIS ignored later air quality studies that described the cumulative air quality from these power plants, in subsequent EISes and a DNS. For instance, a review of the Plymouth EIS modeling shows that the Wanapa DEIS' claims are inaccurate about the lack of a cumulative air quality impact. The Wanapa DEIS alleges that there would be either none or 2 exceedances of the 10% threshold, and 2 exceedances of the 5% threshold of impact on visibility, for a total of 4 days of impacts, as a cumulative result of Wanapa and other proposed and actual power plants.

But the Plymouth DEIS analysis, which included modeling of Wanapa's air emissions, showed a total of 31 days, not 2 days, with more than a 5% change to background extinction because of the operation of Wanapa and other power plants, and 2 days when impacts would exceed 10%.

The Plymouth cumulative air impacts analysis, which studied the effects of the operations of Plymouth, Wanapa, and 13 other power plants totaling 7214 Mw, did show plainly adverse impacts, namely 31 days with greater than 5% change to background extinction. Furthermore, the Plymouth plant was shown to contribute more than .4%, which is a "significant change to extinction" on 17 days, and on two days when the total change exceeded 10%. (Table A-6-1, FEIS, p. III-9)

### **WANAPA WILL DEGRADE VISIBILITY MORE THAN PLYMOUTH**

It is overwhelmingly likely that Wanapa will have an even greater contribution to background extinction, since its air pollution will be roughly 500% more than the Plymouth facility, and it is about the same distance from Mt Hood and the Colombia Gorge, which are the areas showing the more frequent extinction of visibility.

But this DEIS does not contain an analysis of cumulative air impacts, similar to what was performed for the Plymouth EIS, the Wallula EIS, the Starbuck Initial Study, and even the Goldendale Energy DNS. In other words, this DEIS has failed to include the same type of information that is routinely offered in other power plant EISes, and even provided less information that a recent Declaration of Non-Significance prepared on a power plant. This failing violates NEPA for the following reasons.<sup>4</sup>

### **FAILURE TO MODEL CUMULATIVE AIR QUALITY IMPACTS VIOLATES NEPA**

## Responses to Letter 10

- 10-16 See response to Comment 2-1 for cumulative effects analysis for Class I areas and response to Comment 5-3 for cumulative effects analysis for Class II areas.

## Letter 10 Continued

10-17

An agency's failure to include and analyze information that is important, significant, or essential renders an EIS inadequate - for, without such detailed information, there is no way for the public or the agency to adequately assess the impacts of a proposed action. See *California v. Bergland*, 483, 46. Supp. 465, 495 (E.D. Cal. 1980), *aff'd sub nom, California v. Block*, 690 46.2d 753 (9th Cir. 1982) (by failing to disclose key data in a draft EIS, "the Forest Service effectively undercut the twin goals of environmental statements: informed decision making, and full disclosure").

### **CUMULATIVE IMPACTS ARE SIGNIFICANT AND WANAPA MAY DEGRADE VISIBILITY MORE THAN WALLULA**

These cumulative air quality impacts are clearly significant because the impacts exceed 10% on occasion. It is likely that not only will the Wanapa cumulative impacts be substantially greater than the Plymouth cumulative impacts, but the Wanapa impacts will also be greater than the Wallula Power Project impacts. The Wallula facility is about the same size as Wanapa, but it is more distant from Mt. Hood and The Gorge, and Mt. Adams.

As part of the EIS process, a document titled "Newport Wallula Power Project--Contribution to Regional Haze" was prepared. This modeling analysis, which studied the impacts from 13 power plants totaling 5242 Mw, concluded in Table 4 that Wallula would cause a 3.68% increase over background extinction at Mt. Hood, a 3.16% increase at the Gorge, 2.13% increase at Mt. Adams, a 2.21% increase at Eagle Cap Wilderness, and smaller increases ranging from .57% to 1.72% at other Class I areas. Wanapa's impact will certainly be more significant.

10-18

The Wallula haze study was performed because BPA "...based on the results of the Regional Air Quality Modeling Study ... now examine(s) potential cumulative regional haze impacts on a case-by-case basis," according to the Haze Study. The Baseline Source Group for the Wallula study included 13 power plants, but did not include Plymouth and Wanapa. That study showed that Wallula contributed more than .4% to extinction on 3 days when the cumulative impact was over 5% in the Gorge, and more than .4% to extinction on 3 days when extinction was over 5% at Mt. Hood, and on one day when extinction was over 10% at Mt. Hood. Since Wanapa is about 30 miles closer to the Gorge and Mt. Hood, it is very likely that Wanapa will have an even more significant adverse impact on these areas than would Wallula.<sup>5</sup>

The DEIS at page 6-4 misrepresented and ignored the results of these recent visibility studies conducted as part of the NEPA reviews of the Wallula and Plymouth power plants, alternately claiming there were either "no" predicted exceedances or "only two" exceedances of the 10% threshold, and only 2 exceedances of the 5% threshold, when in fact these additional studies predicted dozens of exceedances of the 5% threshold. Nor did the DEIS explain the significance of these findings, especially the importance of the 10% exceedances, which is the significance threshold which mandates a additional review and studies of potential mitigation under NEPA.

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BPA and EFSEC. Wallula Power Project and Wallula-McNary Transmission Line Project. Final Environmental Impact Statement, August, 2002. (DOE/EIS-0330), especially Table 3.2-12

## Responses to Letter 10

10-17

See response to Comment 2-1 for cumulative effects analysis for Class I areas and response to Comment 5-3 for cumulative effects analysis for Class II areas.

10-18

See response to Comment 2-1 for cumulative effects analysis, including visibility, for Class I areas.

## Letter 10 Continued

- 10-18 All of the data presented in this section of these comments is based on firing of natural gas only by the power plants that were studied. If oil is fired in some of them, as is permitted, the impacts on haze will be magnified.

### **PRIOR CUMULATIVE IMPACTS MODELING MAY BE UNDERSTATED**

The DEIS-referenced BPA study, and the Plymouth and Wallula EIS discussions of cumulative impacts, all underestimate the existing and impending cumulative impacts. Those modeling exercises did not even list all likely significant projects, neglecting to even list the Umatilla Depot incinerator, the Pacific Rim Ethanol plant at Moses Lake, the Hanford Nuclear Reservation's Waste Treatment Plant and the recently completed expansion of the Boise/Wallula pulp and paper mill, among other developments. These projects will add another 1000 TPY of NO<sub>x</sub>, and other pollutants to the regional air shed and will certainly contribute to this already-documented cumulative impact on Class I areas, to which Wanapa will undoubtedly also contribute.

- 10-19 There are thousands of tons of proposed and existing NO<sub>x</sub> and other pollutant emissions that will increase haze in the vicinity of the project, including the Boardman, Oregon power plant's emissions of 17,762 TPY. A comprehensive emissions inventory should be included in the DEIS.

There is a total of another 6000 TPY of proposed and existing NO<sub>x</sub> emissions in the vicinity of Wanapa. Few existing Washington sources are counted in this inventory, so this figure is drastically understated. An EIS should be prepared that would include a comprehensive NO<sub>x</sub> area inventory, and which would model the cumulative air quality impacts on Class I areas, from sources including the sources listed in the endnotes, and additional Washington sources.<sup>2</sup>

### **ADDITIONAL CUMULATIVE IMPACTS FROM VOC AND CO EMISSIONS ON VISIBILITY WERE NOT MODELED**

The additional impacts on visibility from VOC emissions were apparently not modeled in either the earlier BPA studies, including the studies referenced in the Wanapa DEIS. VOCs contribute directly to the secondary formation of visibility-reducing organic aerosols, and CO acts as a weak form of VOCs (10 tons of CO have about the same effect as 1 ton of VOC). For this reason, the BPA's and other studies on the cumulative air impacts from power plants, has underestimated the potential impacts on haze from power plants. The DEIS should have included an additional study that took into account the impacts from these two pollutants.

- 10-20 The Forest Service criticized the Plymouth DEIS air quality section for failing to study the impacts of VOCs in haze in the Gorge. In response, the preparers factored in the VOC impacts, and those results demonstrated that the Plymouth Plant would affect visibility by more than the .4% FLAG criterion on 17 days, rather than the 14 days previously predicted without taking VOCs into account.

### **OZONE**

Ozone monitoring at Wishram, which is at the east end of the Gorge, has detected near-exceedances of the Ozone standard in the last few years. The DEIS should have modeled the

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- 10-19 See response to Comment 2-1 for cumulative effects analysis for Class I areas and response to Comment 5-3 for cumulative effects analysis for Class II areas.

- 10-20 See response to Comment 2-1 for cumulative effects analysis, including visibility, for Class I areas and response to Comment 2-2 for Ozone impact assessment.

The guidance documents provided by Federal Land Managers and the available assessment tools do not include an evaluation of VOC and CO impacts on visibility modeling. The impacts of VOC are addressed, however, in an ozone impact assessment prepared for the project (see response to Comment 2-2). Additionally, a dispersion modeling analysis of the CO impacts from Wanapa on the area surrounding the facility was conducted and the results were shown to be below modeling significance levels.

## Letter 10 Continued

10-20

potential maximum cumulative impact on the ozone levels, from these new power plants' emissions of ozone precursors, including Wanapa and Plymouth and others, along with the new emissions from the Boise Wallula expansion, the Hanford waste treatment project Pacific Rim ethanol, and other nearby new emissions sources.

### **DEIS IGNORED SECONDARY EMISSIONS IMPACTS**

The DEIS did not study the contributions to air quality impacts from the ammonia emissions from Wanapa. Ammonia (and other nitrogen compounds) catalyze in the air to form "secondary particulate" which harms human health and severely degrades visibility. This is a well-recognized transaction that was discussed at length, for instance, in the recent DEIS on the BP Cogen.

The DEIS should have studied how much ammonia (and other nitrogen compounds) are already in the air in the plant vicinity, because how much ammonia is already there, determines how much damage the new ammonia will cause.

The DEIS should have described the reactions between SO<sub>3</sub>, NH<sub>3</sub>, and NO<sub>2</sub>, which form salts, some of which are emitted to the atmosphere and some of which deposit within the HRSG. Equations can be used to estimate a portion of the secondary PM<sub>10</sub> that is formed from ammonia slip. Secondary PM<sub>10</sub> can be formed by reaction of ammonia with SO<sub>3</sub> and NO<sub>2</sub> emitted by the gas turbines and present in the stack gases and plume as well as additional SO<sub>3</sub> and NO<sub>2</sub> that are present downwind in the atmosphere.

10-21

Additional ammonium nitrate could form from the reaction of NO<sub>2</sub> in the atmosphere with any emitted ammonia. This additional PM<sub>10</sub> may not have been included in the Project's emissions estimates and its impacts. Apparently the formation of secondary PM<sub>10</sub>, including ammonia nitrate, from the proposed project, was not considered in the EPA air permit application, so the combined PM<sub>10</sub> emissions will be more than estimated by the applicant.

The DEIS should have required disclosure of the secondary particulate emissions from this facility, because secondary emissions are not regulated by EPA and are not limited in the EPA air permit. Since this matter is a potentially significant impact, but outside of the later EPA purview, we ask that BIA/BPA require the calculation of these secondary emissions and disclose these impacts and offer mitigation. The other Wallula and Plymouth Haze studies also neglected to consider these ammonia impacts. For instance, the Wallula haze study said that it reviewed the formation of secondary aerosols from conversion of NO<sub>x</sub> and SO<sub>2</sub>. But the study never plainly stated that it added in the conversion of ammonia into its projected impacts.

NEPA requires a complete, comprehensive air quality impact study, including monitoring of existing air quality for a variety of pollutants, including ammonia, at Class I areas and the Gorge Scenic Areas.

Much of the nitrogen oxides from the smokestacks will fall to the earth and onto water bodies nearby as nitric acids and related compounds which damage plant life. NEPA requires a study

## Responses to Letter 10

10-21

The project would emit ammonia from the turbine generator stacks at a maximum concentration of 5 ppm, per the draft air quality permit from the USEPA. This emission rate would result in a maximum annual ambient impact (at the receptor with the highest concentration of ammonia) of 1.99 parts per billion (ppb). Ammonia impacts from Wanapa at other locations are much lower than this amount. This maximum impact can be compared with typical background concentrations of ammonia in grassland areas of 10 ppb.

The primary mechanism for the formation of secondary particulate is the interaction of ammonia with nitrogen and sulfur compounds in the turbine exhaust. Since the secondary particulate by definition is not emitted directly and forms over a period of time based on chemical reactions between constituents in the atmosphere, it is most appropriately included only in far-field analyses such as the Class I area modeling studies. For the project, secondary particulate formation has been addressed in the CALPUFF dispersion modeling conducted for the evaluation of air quality and visibility impacts in the Class I areas and the Columbia River Gorge.

## Letter 10 Continued

10-21 about the impacts on vegetation and water quality from this air pollution.

### ALTERNATIVE POLLUTION CONTROL—ELIMINATE AMMONIA EMISSIONS AND THREAT OF AMMONIA RELEASE

The power plant will store, and emit ammonia for use in their SCR air pollution scrubbing system. This presents dangers to public health and to air quality. SCONOX is an alternative pollution scrubbing system that does not use ammonia. SCONOX should have been comprehensively discussed in the DEIS as an alternative to the proposed project. Study of Alternatives is the heart of NEPA.

Because use of SCONOX would reduce the transport, storage and use of ammonia at the plant site, and would reduce secondary air pollution, discussion of SCONOX as mitigation for the project's impacts should have been part of the DEIS.

### BENEFITS OF SCONOX NEED TO BE CONSIDERED

10-22 The SCR system proposed for use by the Applicants results in a number of environmental problems that are reduced or eliminated with the use of SCONOX. These problems include: (1) hazards from accidental releases of the ammonia used in the SCR system during its transportation and handling; (2) the formation of particulate matter from the oxidation of SO<sub>2</sub> in the SCR catalyst; (3) the formation of particulate matter from reactions between ammonia and SO<sub>2</sub>; (4) generation and disposal of the hazardous SCR catalyst at the end of its useful life; (5) inability to control NO<sub>x</sub> and CO emissions during startups and shutdowns; (6) increase in NO<sub>2</sub> from the use of dry low NO<sub>x</sub> combustors, and (7) secondary particulate formed from ammonia emissions

SCONOX would produce greater control of NO<sub>x</sub> and other pollutants, and eliminate ammonia emissions, and the threat of releases from storage and transport of ammonia. The EPA has recently ruled that SCONOX is considered technically "Available" for NO<sub>x</sub> control on natural gas fired turbine power plants. The DEIS should have described SCONOX as a method of mitigating the project's potential nuisance impacts from storage, transport and use of ammonia.

### AMMONIA RELATED PM<sub>10</sub> FORMATION ENDANGERS BIOTA

10-23 The majority of the ammonia emissions (slip) from the Wanapa plant will react with NO<sub>x</sub> to form ammonium nitrate, which is "secondary" PM<sub>10</sub>. This PM<sub>10</sub> can be deposited on surrounding hills, located immediately adjacent to the site, and at more distant areas also. This is an especially significant impact, because the Federal Land Manager's IMPROVE air monitoring project in the Columbia Gorge show that almost 40% of fine particulate in the Gorge vicinity is made up of ammonia compounds; ammonium sulfate and ammonium nitrate. These same ammonia compounds total 50-80% of the visibility-reducing air pollutants in the Gorge vicinity.<sup>6</sup>

Van Harem, Frank. WDOE Visibility Coordinator. "Visibility Monitoring Data Analysis for the CRGNSA, 9/96-8/97." Handout distributed at Columbia River Gorge Commission Meeting, April 13, 1999.

## Responses to Letter 10

10-22 Non-ammonia selective catalytic reduction (referred to as SCONOX) is a recently developed technology that uses a potassium carbonate (K<sub>2</sub>CO<sub>3</sub>) catalyst to reduce NO<sub>2</sub> emissions. As noted by the commenter, there is no ammonia injection required for use of the SCONOX technology. This technology has been demonstrated on small turbines (up to 50 MW), but has not yet been successfully applied in the field to larger gas turbines. SCONOX has not been used to date with large (F-class) gas turbines.

As evidenced in the literature, one company, Alstrom, conducted tests with medium-sized gas turbines and concluded that SCONOX can be *scaled up* for use in large gas turbines without actually performing such test and evaluation of results with large size gas turbines. This manufacturer discontinued its manufacturing of large gas turbines due the failure of their performance SCONOX has not been used to date with large (F-class) gas turbines and a scale up of the equipment without any test and the manufacturer guarantee of its performance would lead to failure and make the project unfinanceable.

Wanapa must use the best available technology for pollution controls. During the PSD permit application process, SCONOX was analyzed and evaluated carefully to determine its application as the best available technologies for the NO<sub>x</sub> control. In addition to the lack of a successful large turbine application of SCONOX, it did not meet the economics criterion established for the application of the best available technology. The results of that evaluation demonstrated that SCONOX does not provide cost-effective control of NO<sub>x</sub> and that SCONOX would introduce a high risk for lack of proper performance in removing this pollutant (NO<sub>x</sub>). SCONOX cannot be guaranteed to perform effectively with the state of the art gas turbine technologies including the F-technology gas turbines used in large size plants such as Wanapa. The Selective Catalytic Reduction (SCR) technology proposed for the new turbines will reduce NO<sub>x</sub> emissions as well or better than SCONOX.

10-23 See responses to Comments 10-21 and 2-1.